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(71) Applicant (for all designated States except US): IONALYTICS CORPORATION [CA/CA]; Building M-50, IPF, 1200 Montreal Road, Ottawa, Ontario K1A 0R6 (CA).

(72) Inventor; and

(75) Inventor/Applicant (for US only): GUEVREMONT, Roger [CA/CA]; 2059 Gatineau View Crescent, Ottawa, Ontario K1J 7W9 (CA).

(74) Agent: FREEDMAN, Gordon; Freedman & Associates, 117 Centrepointe Drive, Suite 350, Nepean, Ontario K2G 5X3 (CA).

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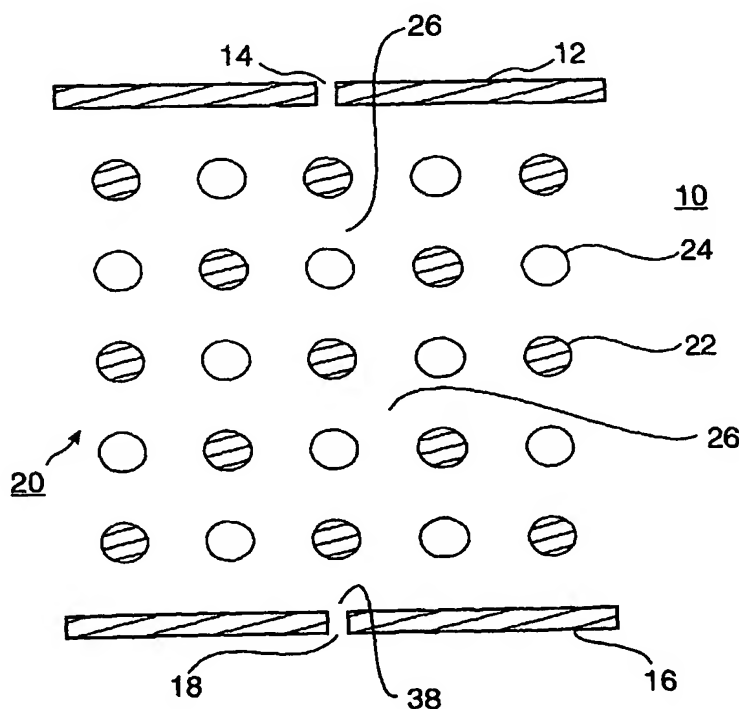
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(54) Title: HIGH FIELD ASYMMETRIC WAVEFORM ION MOBILITY SPECTROMETER AND METHOD THEREFORE



(57) **Abstract:** Disclosed is an apparatus for separating ions including a plurality of first electrode portions, each first electrode portion of the plurality of first electrode portions having a first length and an outer surface that is at least partially curved in a direction transverse to the first length. The apparatus also includes a plurality of second electrode portions arranged in an alternating sequence with the plurality of first electrode portions, each second electrode portion of the plurality of second electrode portions having a second length and an outer surface that is curved in a direction transverse to the second length, a space between the outer surface of a first electrode portion and the outer surface of an adjacent second electrode portion defining a portion of an analytical gap for separating ions. At least an electrical controller is provided for electrically coupling to at least one of the plurality of first electrode portions and the plurality of second electrode portions, for applying an asymmetric waveform voltage between the at least one of the plurality of first electrode portions and the plurality of second electrode portions and for applying a direct current voltage between the at least one of the plurality of first electrode portions and the plurality of second electrode portions so as to establish an electric field within the portion of the analytical gap. During use, ions propagating along

a direction that is transverse to both the first length and the second length are separated in the portion of the analytical gap between the outer surface of the first electrode portion and the outer surface of the adjacent second electrode portion.

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